

**WHAT IS CLAIMED IS:**

- 1    1. An apparatus which holds an optical fiber in alignment to an optical device, said  
2    apparatus comprising:
  - 3       a fiber holder having a first plurality of indentations formed therein;
  - 4       an optical fiber within one of said first plurality of indentations;
  - 5       a base substrate having a second plurality of indentations formed into said base;
  - 6       a plurality of spacers, each of said plurality of spacers within a corresponding  
7       one of the second plurality of indentations, wherein said fiber holder is mounted on said  
8       base with said plurality of spacers within said first plurality of indentations; and  
9       an optical device mounted to said base.
- 1    2. The apparatus of claim 1 wherein the optical device comprises a lens.
- 1    3. The apparatus of claim 1 wherein the first plurality of indentations includes an  
2       elongated groove, and wherein said optical fiber is held within the elongated groove.
- 1    4. The apparatus of claim 1 wherein the second plurality of indentations includes at least  
2       one trapezoidal-shaped pocket.
- 1    5. The apparatus of claim 4 wherein the second plurality of indentations includes an  
2       elongated groove, and wherein said optical device comprises a lens mounted to said base  
3       within the elongated groove.
- 1    6. The apparatus of claim 1 wherein at least one of said plurality of spacers are  
2       spherically-shaped.
- 1    7. The apparatus of claim 6 wherein at least one of said plurality of spacers and said  
2       optical device are made of the same material.
- 1    8. The apparatus of claim 7 wherein the first plurality of indentations includes at least  
2       one trapezoidal-shaped pocket.

1       9. The apparatus of claim 1 wherein the second plurality of indentations includes at least  
2       one trapezoidal-shaped pocket.

1       10. The apparatus of claim 9 further comprises:

2              a single spacer mounted within one of said second plurality of indentations,  
3       wherein said fiber holder is mounted to said base in contact with said single spacer at an  
4       end of said fiber holder and establishes a horizontal position of said fiber holder.

1       11. The apparatus of claim 9 wherein one of the second plurality of indentations is  
2       formed to a different depth than a second of the second plurality of indentations.

1       12. The apparatus of claim 2 wherein said base further comprises:

2              a third plurality of indentations formed in said base; and  
3              a second plurality of spacers, each of said second plurality of spacers within a  
4       corresponding one of said third plurality of indentations, wherein said optical device is  
5       mounted to said base in contact with at least two of said second plurality of spacers and  
6       establishes a horizontal position of said optical device.

1       13. The apparatus of claim 12 wherein said optical device has a round central section.

1       14. The apparatus of claim 12 wherein the optical device comprises one of a dome-  
2       shaped lens and a disk-shaped lens.

1       15. The apparatus of claim 2 wherein said base further comprises:

2              a third plurality of indentations formed in said base; and  
3              a second plurality of spacers, each of said second plurality of spacers within a  
4       corresponding one of said third plurality of indentations, wherein said optical device is  
5       mounted to said base in contact with at least three of said second plurality of spacers and  
6       establishes a vertical position of said optical device.

1       16. The apparatus of claim 15 wherein said optical device has at least one flat face.

- 1        17. The apparatus of claim 15 wherein said optical device comprises one of a dome-shaped lens and a disk-shaped lens.
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- 1        18. The apparatus of claim 1 wherein the second plurality of indentations formed in said base includes at least one indentation located adjacent to an edge of said base, and wherein one of said plurality of spacers held within the one indentation adjacent to the edge of said base protrudes beyond the edge of said base and establishes a known distance from a contact point on said spacer to a point on said base.
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- 1        19. The apparatus of claim 18 wherein the one indentation adjacent to the edge of said base is a trapezoidal-shaped pocket, and wherein the one of said plurality of spacers held within the one indentation adjacent to the edge of said base contacts an interior wall of the trapezoidal-shaped pocket.
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- 1        20. An apparatus which holds a plurality of optical fibers in alignment to a plurality of optical devices, said apparatus comprising:
  - 3              a fiber holder having a first plurality of indentations formed therein;
  - 4              a plurality of optical fibers, each of said plurality of fibers within a corresponding one of the first plurality of indentations;
  - 5              a base substrate having a second plurality of indentations formed into said base;
  - 6              a plurality of spacers, each of said plurality of spacers within a corresponding one of the second plurality of indentations, wherein said fiber holder is mounted on said base with said plurality of spacers within said first plurality of indentations; and
  - 7              a plurality of optical devices mounted to an end of said fiber holder wherein each of said plurality of optical devices are aligned with a one of said plurality of optical fibers.
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- 1        21. The apparatus of claim 20 wherein at least one of said plurality of optical devices comprises a lens.
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- 1        22. A method of aligning optical devices comprising:

2           mounting a first optical device on a first base having a partial indentation formed  
3       in an edge of said first base that holds a spacer to protrude beyond the edge of said first  
4       base and establishes a known distance from a point on the spacer to the first optical  
5       device;

6           mounting a second optical device on a second base; and

7           aligning the second optical device to the first optical device by placing the  
8       second base to contact the spacer held in the first base.